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### Net Exchange Ecosystem in Subtropical Agriculture Area in Southern Brazil

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Southern Brazil contribute to 38% of Brazilian grain production. In contrast with the rest of the country, the south has a wet, subtropical climate that permits two annual harvests (double cropping system). The soybean and/or maize (summer) and black oat and/or wheat (winter) succession is widely used by farmers in plateau areas. In river natural lowlands, the cultivation of flooded irrigated rice is common. Changes in the land use affect the carbon, water and energy balance, and crop management practices, such as fertilization, water management, harvest and crop residues have influence in carbon exchange between the crop field and the atmosphere. This study quantifies the net exchange ecosystem (NEE) between the atmosphere and the crop cultivations in this wide region of Brazil from 2010 to 2014. We use data from two micrometeorological sites: Cruz Alta, with crop rotation and Cachoeira do Sul, with rice paddy. The carbon flux was analyzed using the eddy covariance method and gap filling procedures. The annual integration of data carbon demonstrates that the agroecosystems in southern Brazil is acting as a light atmospheric CO<sub>2</sub> sink. However, the NEE emissions that occurred in the fallow periods contributed negatively for such annual accumulation. To reduce this loss of CO<sub>2</sub>, farmers could cultivate plants in fallow periods, because there are favorable weather conditions for growing plants year round. Additionally, other management practices can increase the influx of C, including the production of more dry matter with cover crops by improving management and the immediate harvesting of crop after physiological maturity to reduce the period between maturation and harvest.

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